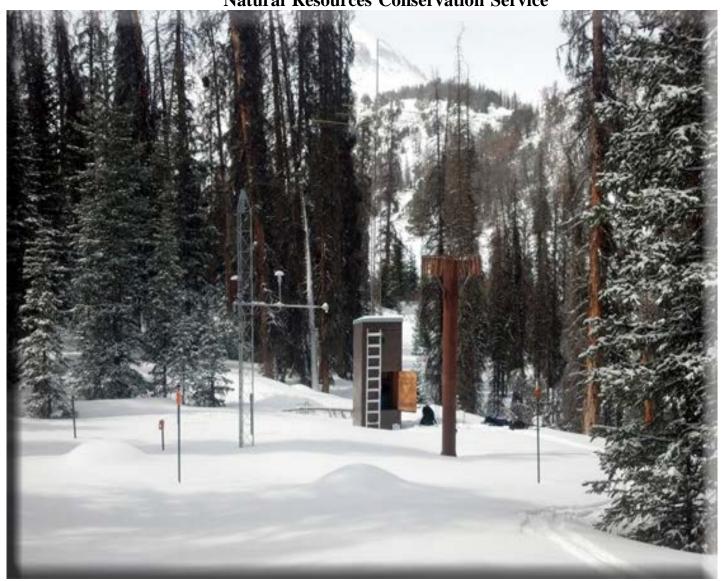


## Wyoming Basin Outlook Report June 1, 2017

**Natural Resources Conservation Service** 



Kirwin SNOTEL 09F24S, ID560 established 10/01/1979 (In the Shoshone Forest 28 miles NNE of Dubois, WY)

## **Basin Outlook Reports**And

#### Federal - State - Private Cooperative Snow Surveys

For more water supply and resource management information, contact:

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#### How forecasts are made

Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual snow courses and automated SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño / Southern Oscillation are used in computerized statistical and simulation models to prepare runoff forecasts. Unless otherwise specified, all forecasts are for flows that would occur naturally without any upstream influences.

Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

The wider the spread among these values, the more uncertain the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. (Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount.) By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

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#### **Wyoming Water Supply Outlook Report**

#### General

The snow water equivalent (SWE) across Wyoming is above median on Jun 1<sup>st</sup> at 228%. The year-to-date precipitation average for Wyoming basins is now at 130% varying from 80-166% of average. Monthly precipitation for the basins varied from 47-148% of average for an overall average of 83%. Basin reservoir levels for Wyoming vary from 59-194% of average for an overall average of 127%. Forecasted runoff varies from 59-290% of average across the Wyoming basins for an overall average of 174%.

#### **Snowpack**

Snow water equivalent (SWE), across Wyoming is above median for June  $1^{\rm st}$  at 228%. SWE in the Black Hills of Wyoming was the lowest at 0%. While SWE in the Sweetwater River Basin is the highest at 1609% of median? See Appendix A for further information.

#### **Precipitation**

Last month's precipitation was below average across the Wyoming Mountains at 83% of average. Year to date precipitation is at 130% of average. The South Platte River Basin had the highest precipitation for the month at 148% of average. The Upper Bear River Basin had the lowest precipitation amount at 47% of average. The following table displays the major river basins and their departure from average for last month.

	Departure		Departure
Basin	from average		from average
Snake River	-55%	Upper North Platte River	+10%
Madison-Gallatin	-55%	Sweetwater River	+23%
Yellowstone River	-41%	Lower North Platte River	+27%
Wind River	+0%	Laramie River	+23%
Bighorn River	-26%	South Platte River	+48%
Shoshone River	-41%	Little Snake River	-15%
Powder River	-30%	Upper Green River	-37%
Tongue River	-13%	Lower Green River	-29%
Belle Fourche River	-45%	Upper Bear River	-53%
Cheyenne River	-11%		

See Appendix B for further information.

#### Streams

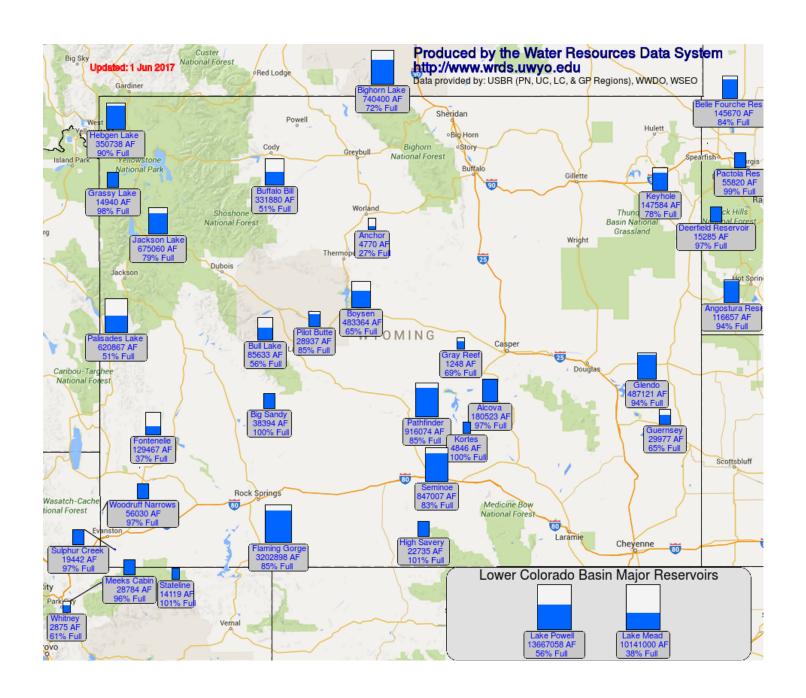
Stream flow yields for June-Sept or June-July are forecast to be above average statewide over Wyoming at 174%. The Snake, Madison, and Upper Yellowstone River Basins should yield about 176%, 116% and 126% of average, respectively. Yields from the Wind and Bighorn River Basins should be about 264% and 267% of average, respectively. Yields from the Shoshone and Clarks Fork River Basins of Wyoming should be about 185% and 154% of average, respectively. Yields from the Powder & Tongue River Basins should be about 218% and 131% of average, respectively. Yield for the Cheyenne River Basin should be about 59% of average. Yields for the Upper North Platte, Sweetwater, Lower North Platte, and Laramie River Basins of Wyoming should be about 125%, 290%, 136%, and 125% of average, respectively. Yields for the Little Snake, Green River, and Smith's Fork Basins of Wyoming should be 81%, 212%, and 214% of average respectively. See Appendix C for further information.

#### Reservoirs

Reservoirs are above average at 127% for the entire state. Reservoirs in the Snake River Basin are below average at 92%. Reservoirs in the Madison-Gallatin River Basins are about average at 102%. Reservoirs in the Wind River Basin are below average at 91%. Reservoirs on the Big Horn are below average at 87%. The Buffalo Bill Reservoir on the Shoshone is below average at 86%. The Tongue River Basin Reservoir is above average at 154%. Reservoirs in the Belle Fourche and Cheyenne River Basins are above average in storage at 107 & 110% respectively. Reservoirs on the Upper and Lower North Platte River Basins are above average at 139% and 121% respectively. Reservoirs on the Laramie and Little Snake River basins are above average at 160% and 105% respectively. Reservoirs on the Upper Green River are below average at 86%. Reservoirs on the Lower Green River Basin are about average at 103%. Reservoir on the Upper Bear River Basin is above average at 125%. See Below.

### Wyoming Reservoir Levels for June $1^{\text{st}}$ , 2017

WYOMING	Current	Last	Average	Capacity	y Current	Last	Average	Current	Last
	(KAF)	Year	(KAF)	(KAF)	%	Year %	%	%	Year %
Alcova	179.6	179.6	178.9	184.3	97%	97%	97%	100%	100%
Bighorn Lake	729.8	791.0	773.6	1356.0	54%	58%	57%	94%	102%
Big Sandy	28.0	22.5	23.1	38.3	73%	59%	60%	121%	97%
Boysen	424.9	572.0	476.4	596.0	71%	96%	80%	89%	120%
Buffalo Bill	357.4	449.3	336.3	646.6	55%	69%	52%	106%	134%
Bull Lake	60.1	76.4	75.1	151.8	40%	50%	49%	80%	102%
Fontenelle	127.8	173.5	125.0	344.8	37%	50%	36%	102%	139%
Glendo	459.8	462.4	434.5	506.4	91%	91%	86%	106%	106%
Grassy Lake	13.3	14.1	12.8	15.2	88%	93%	84%	104%	110%
Guernsey	28.2	35.6	29.9	45.6	62%	78%	66%	94%	119%
High Savery Reservoir	20.9	17.1	15.3	22.4	93%	76%	68%	137%	112%
Jackson Lake	462.2	628.9	445.7	847.0	55%	74%	53%	104%	141%
Kendrick Project	920.9	931.6		1201.7	77%	78%			
Keyhole	149.0	168.8	98.1	193.8	77%	87%	51%	152%	172%
Meeks Cabin Reservoir	24.7	14.3	16.5	32.5	76%	44%	51%	150%	86%
North Platte Project	1106.7	999.1		1062.1	104%	94%			
Pathfinder	1008.4	925.1	617.9	1016.5	99%	91%	61%	163%	150%
Pilot Butte	25.9	26.5	26.1	31.6	82%	84%	83%	99%	101%
Seminoe	738.8	739.6	492.5	1016.7	73%	73%	48%	150%	150%
Viva Naughton Res	18.7	38.1	31.6	42.4	44%	90%	75%	59%	121%
Wheatland #2	73.5	86.2	55.6	98.9	74%	87%	56%	132%	155%
Woodruff Narrows Reservoir	50.8	57.4	45.5	57.3	89%	100%	79%	112%	126%
Basin-wide Total	4981.8	5478.3	4310.4	7244.1	69%	76%	60%	116%	127%
# of reservoirs	20	20	20	20	20	20	20	20	20

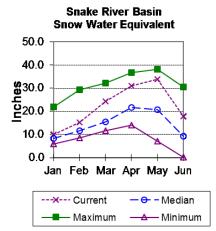


#### **Snake River Basin**

#### Snow

The Snake River Basin SWE above Palisades is 194% of median (73% last year). SWE in the Snake River Basin above Jackson Lake is 221% of median (0% last year). Pacific Creek Basin SWE is ---% of median (--% last year). Buffalo Fork SWE is 126% of median (68% last year). Gros Ventre River Basin SWE is 200% of median (102% last year). SWE in the Hoback River drainage is 281% of median (144% last year). SWE in the Greys River drainage is 362% of median (127% last year). The Salt River Basin SWE is 613% of median (0% last year).

See Appendix A at the end of this report for a detailed listing of snow course information.



#### Precipitation

Last month's precipitation for the Snake River Basin was 45% of average (108% last year). Percentages range from 19-75% of average for the 28 reporting stations. Water-year-to-date precipitation is 153% of average for the Snake River Basin (97% last year). Year-to-date percentages range from 132-183% of average.

#### Reservoirs

Current reservoir storage is 92% of average for the three storage reservoirs in the basin. Grassy Lake storage is about 104% of average (14,900 ac-ft compared to 15,300 last year). Jackson Lake storage

is 111% of average (675,100 ac-ft compared to 791,700 ac-ft last year). Palisades Reservoir storage is about 80% of average (820,900 ac-ft compared to 1,187,400 ac-ft last year). Detailed reservoir data shown on the following page and in Appendix D.

# Precipitation 350 300 250 150 100 Oct Dec Feb Apr

Snake River Basin

#### Streamflow

The 50% exceedance forecasts for June through September are

way above average for this basin. The Snake near Moran will yield about 775,000 ac-ft (153% of average). Snake River above Reservoir near Alpine will yield about 2,840,000 ac-ft (176% of average). The Snake near Irwin will yield about 3,850,000 ac-ft (176% of average). The Snake near Heise yield will be about 4,100,000 ac-ft (174% of average). Pacific Creek at Moran will yield about 172,000 ac-ft (179% of average). Buffalo Fork above Lava near Moran yield will be around 385,000 ac-ft (160% of average). Greys River above Palisades Reservoir yield will be around 405,000 ac-ft (179% of average). Salt River near Etna yield will be around 400,000 ac-ft (190% of average). See the following page for further information.

#### Snake River Basin Strea<u>mflow Forecasts - June 1, 2017</u>

		•	nt					
SNAKE RIVER BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Snake R nr Moran <sup>,2</sup>								
	JUN-JUL	575	630	665	156%	700	755	425
	JUN-SEP	670	730	775	153%	820	880	505
Snake R ab Reservoir nr Alpine.2								
	JUN-JUL	2150	2260	2340	183%	2410	2520	1280
	JUN-SEP	2610	2750	2840	176%	2930	3060	1610
Snake R nr Irwin ,2								
	JUN-JUL	2840	2990	3090	182%	3190	3340	1700
	JUN-SEP	3550	3730	3850	176%	3970	4160	2190
Snake R nr Heise <sup>2</sup>								
	JUN-JUL	3000	3150	3260	181%	3360	3510	1800
	JUN-SEP	3780	3970	4100	174%	4230	4410	2350
Pacific Ck at Moran								
	JUN-JUL	133	149	159	185%	170	186	86
	JUN-SEP	144	160	172	179%	183	199	96
Buffalo Fk ab Lava Ck nr Moran								
	JUN-JUL	290	315	330	161%	345	365	205
	JUN-SEP	340	365	385	160%	405	430	240
Greys R ab Reservoir nr Alpine								
	JUN-JUL	295	310	320	195%	330	345	164
	JUN-SEP	370	390	405	188%	415	435	215
Salt R ab Reservoir nr Etna								
	JUN-JUL	255	275	290	203%	310	330	143
	JUN-SEP	355	380	400	190%	420	450	210

<sup>1) 90%</sup> and 10% exceedance probabilities are actually 95% and 5%

<sup>3)</sup> Median value used in place of average

Reservoir Storage End of May, 2017	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Grassy Lake	14.9	15.3	14.3	15.2
Jackson Lake	675.1	791.7	605.7	847.0
Palisades Reservoir	820.9	1187.4	1027.0	1400.0
Basin-wide Total	1510.9	1994.4	1647.0	2262.2
# of reservoirs	3	3	3	3

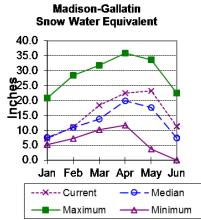
Watershed Snowpack Analysis June 1, 2017	# of Sites	% Median	Last Year % Median
SNAKE above Jackson Lake	4	221%	0%
PACIFIC CREEK	1		
BUFFALO FORK	2	126%	68%
GROS VENTRE RIVER	2	200%	102%
HOBACK RIVER	3	281%	144%
GREYS RIVER	5	362%	127%
SALT RIVER	3	613%	0%
SNAKE RIVER BASIN	19	194%	73%

<sup>2)</sup> Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

#### Madison-Gallatin Rivers Basin

#### Snow

In the Madison-Gallatin drainage, SWE is 151% of median (46% last year). See Appendix A at the end of this report for a detailed listing of snow course information.

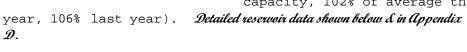


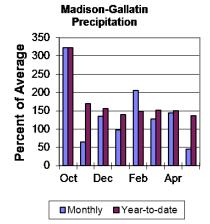
#### Precipitation

Last month's precipitation in the Madison-Gallatin drainage was 45% of average (77% last year). The 6 reporting station percentages range from 33-68% of average. Water-year-to-date precipitation is about 136% of average, which was 84% last year. Year to date percentage ranges from 125-156%.

#### Reservoirs

Ennis Lake is storing about 36,200 ac-ft of water (88% of capacity, 102% of average this year or about 103% last year). Hebgen Lake is storing about 343,400 ac-ft of water (89% of capacity, 102% of average this





#### Streamflow

The 50% exceedance forecast for June through September is above average for the basin. Hebgen Reservoir inflow will be about 325,000 ac-ft (116% of average). See below for detailed runoff volumes.

Data Current as of: 6/5/2017 5:10:04 PM

### Madison-Gallatin River Basins Streamflow Forecasts - June 1, 2017

Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast

MADISON-GALLATIN RIVER BASINS	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Hebgen Reservoir Inflow	JUN-JUL	175	199	215	121%	230	255	178
	JUN-SEP	265	300	325	116%	350	385	280

- 1) 90% and 10% exceedance probabilities are actually 95% and 5%
- 2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
- 3) Median value used in place of average

Reservoir Storage End of May, 2017	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Ennis Lake	36.2	36.6	35.6	41.0
Hebgen Lake	343.4	355.4	336.2	378.8
Basin-wide Total	379.6	392.0	371.8	419.8
#of reservoirs	2	2	2	2

Watershed Snowpack Analysis June 1, 2017	# of Sites	% Median	Last Year % Median
MADISON-GALLATIN RIVER BASINS	5	151%	46%

#### Yellowstone River Basin

#### Snow

SWE in the Yellowstone River Basin is 150% of median (61% last year). SWE in the Yellowstone River Drainage in WY is 143% of median (53% last year). SWE in the Clarks

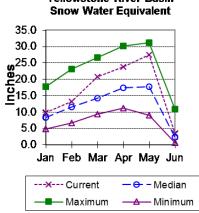
Yellowstone River Basin
Snow Water Equivalent

Yellowstone River Basin
Snow Water Equivalent

Fork Drainage of the Yellowstone River Basin in Wyoming is

156% of median (67% last year). See Appendix A at the end of this report

for a detailed listing of snow course information.



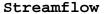
#### Precipitation

Last month's precipitation in the Yellowstone River Basin was 59% of average (83% last year). The 17 reporting station percentages range from 34-116% of average. Water-year-to-date precipitation is

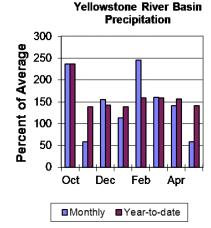
141% of average, which was 90% last year. Year to date percentages range from 92-175%.

#### Reservoirs

No reservoir data



The 50% exceedance forecasts for June through September are way above average for the basin. Yellowstone River at Lake Outlet will yield around 885,000 ac-ft (135% of average). Yellowstone at Corwin Springs will yield around 1,670,000 ac-ft (126% of average). Yellowstone near Livingston will yield around 1,920,000 ac-ft (126% of average). Clarks Fork of the Yellowstone near Belfry will yield around 610,000 ac-ft



of the Yellowstone near Belfry will yield around 610,000 ac-ft (154% of average). See the following for further information.

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#### Yellowstone River Basin Streamflow Forecasts - June 1, 2017

Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast

YELLOWSTONE RIVER BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Yellowstone R at Yellowstone Lake Outlet								
	JUN-JUL	500	570	620	133%	670	740	465
	JUN-SEP	740	825	885	135%	940	1030	655
Yellowstone R at Corwin Springs								
	JUN-JUL	1130	1260	1340	129%	1420	1550	1040
	JUN-SEP	1420	1570	1670	126%	1770	1920	1330
Yellowstone R at Livingston								
_	JUN-JUL	1280	1440	1540	131%	1640	1790	1180
	JUN-SEP	1600	1790	1920	126%	2040	2230	1520
Clarks Fk Yellowstone R nr Belfry <sup>2</sup>								
-	JUN-JUL	480	525	555	159%	585	630	350
	JUN-SEP	520	575	610	154%	645	700	395

<sup>1) 90%</sup> and 10% exceedance probabilities are actually 95% and 5%

<sup>3)</sup> Median value used in place of average

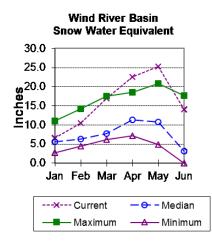
Watershed Snowpack Analysis June 1, 2017	# of Sites	% Median	Last Year % Median
YELLOWSTONE RIVER in WY	7	143%	53%
CLARKS FORK in WY	8	156%	67%

<sup>2)</sup> Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

#### Wind River Basin

#### Snow

Wind River Basin above Boysen Reservoir SWE is 441% of median (186% last year). SWE in the Wind River above Dubois is 177% of median (79% last year). Little Wind River SWE above Riverton is 469% of median (275% last year), and Popo Agie drainage SWE is 940% of median (380% last year). See Appendix A at the end of this report for a detailed listing of snow course information.



#### Precipitation

Precipitation for the Wind River Basin was 100% of average (150% last year) from the 11 reporting stations. Last month's basin's precipitation varied from 46-154% of average. Water year-to-date precipitation is 165% of average and was 113% last year at this time. Year-to-date percentages range from 125-207% of average.

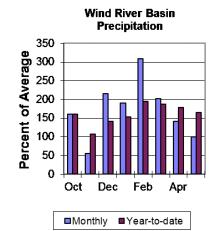
#### Reservoirs

Current storage in Bull Lake is 84,900 ac-ft (96% of average) (109,300 ac-ft last year at 124% of average). Boysen Reservoir is storing (443,300 ac-ft) (89% of average) or (601,200 ac-ft last year at 121% of average). Pilot Butte is at 118% of average (26,300 ac-ft) (26,200 ac-ft or about 117% last year). Detailed reservoir data shown on the following page and

in Appendix D.

#### Streamflow

The 50% exceedance forecasts for the June through September runoff period are at record levels for most of the Wind River Basin. Dinwoody Creek near Burris should yield around 106,000 ac-ft (133% of average). The Wind River above Bull Lake Creek will yield around 775,000 ac-ft (212% of average). Bull Lake Creek near Lenore will yield around 255,000 ac-ft (183% of average). Wind River at Riverton will yield around 885,000 ac-ft (206% of average). Little Popo Agie River near Lander should yield around 79,000 ac-ft (239% of average). South Fork of Little Wind near Fort Washakie will yield around ac-ft (% of average). Little Wind River near Riverton will yield around 560,000 ac-ft (267% of average). Boysen Reservoir inflow will yield around



1,280,000 ac-ft (264% of average). See the following page for detailed runoff volumes.

# Wind River Basin Streamflow Forecasts - June 1, 2017 Forecast Exceedance Probabilities for Risk Assessment

recast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

WIND RIVER BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Dinwoody Ck nr Burris								
	JUN-JUL	68	73	76	143%	79	84	53
	JUN-SEP	95	102	106	133%	111	118	80
Wind R Ab Bull Lake Ck								
	JUN-JUL	625	675	705	214%	740	790	330
	JUN-SEP	670	735	775	212%	820	885	365
Bull Lake Ck nr Lenore								
	JUN-JUL	188	198	205	190%	210	220	108
	JUN-SEP	235	245	255	183%	265	275	139
Wind R at Riverton								
	JUN-JUL	675	725	755	216%	790	835	350
	JUN-SEP	780	840	885	206%	925	990	430
Little Popo Agie R nr Lander								
	JUN-JUL	63	67	70	259%	73	77	27
	JUN-SEP	71	76	79	239%	82	87	33
Little Wind R nr Riverton								
	JUN-JUL	455	490	515	281%	540	575	183
	JUN-SEP	490	530	560	267%	590	630	210
Boysen Reservoir Inflow								
-	JUN-JUL	1030	1110	1170	275%	1230	1310	425
	JUN-SEP	1110	1210	1280	264%	1350	1460	485

<sup>1) 90%</sup> and 10% exceedance probabilities are actually 95% and 5%

<sup>3)</sup> Median value used in place of average

Reservoir Storage	Current	Last Year	Average	Capacity
End of May, 2017	(KAF)	(KAF)	(KAF)	(KAF)
Bull Lake	84.	9 109.3	88.3	151.8
Boysen	443.	3 601.2	498.4	596.0
Pilot Butte	26.	3 26.2	22.3	31.6
Basir	n-wide Total 554.	5 736.7	609.0	779.4
# c	of reservoirs	3 3	3	3

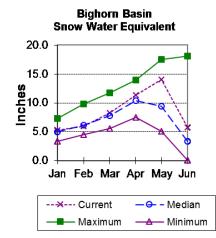
Watershed Snowpack Analysis June 1, 2017	# of Sites	% Median	Last Year % Median
WIND above Dubois	2	177%	79%
LITTLE WIND	2	469%	275%
POPO AGIE	4	940%	380%
WIND RIVER BASIN	9	441%	186%

<sup>2)</sup> Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

#### **Bighorn River Basin**

#### Snow

The Bighorn River Basin SWE above Bighorn Reservoir is 170% of median (65% last year). The Nowood River SWE is 0% of median (0% last year). The Greybull River SWE is 800% of median (0% last year). Shell Creek SWE is at 136% of median (69% last year). See Appendix A at the end of this report for a detailed listing of snow course information.

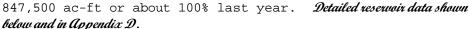


#### Precipitation

Last month's precipitation was 74% of average (91% last year). Sites ranged from 47-111% of average for the month. Year-to-date precipitation is 130% of average (95% last year). Year-to-date percentages, from the 19 reporting stations, range from 78-212%.

#### Reservoirs

Boysen Reservoir is currently storing 443,300 ac-ft (89% of average). Bighorn Lake is now at 722,700 ac-ft (85% of average). Boysen was at 601,200 ac-ft or about 121% of average last year and Bighorn Lake was at



# Bighorn Basin Precipitation 250 250 200 150 0 Cot Dec Feb Apr

#### Streamflow

The 50% exceedance forecasts for the June through Sept. runoffs are at record levels for most of the basin. Boysen Reservoir inflow should yield 1,280,000 ac-ft (264% of

average); the Greybull River near Meeteetse should yield around 250,000 ac-ft (176% of average); Shell Creek near Shell should yield around 51,000 ac-ft (111% of average) and the Bighorn River at Kane should yield around 1,680,000 ac-ft (267% of average). See the following for detailed runoff.

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#### Bighorn River Basin

Streamflow	Forecasts - June 1, 2017
	Forecast Exceedance Probabilities for Risk Assessment

Chance that actual volume will exceed forecast

BIGHORN RIVER BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Boysen Reservoir Inflow								
	JUN-JUL	1030	1110	1170	275%	1230	1310	425
	JUN-SEP	1110	1210	1280	264%	1350	1460	485
Greybull R nr Meeteetse								
•	JUN-JUL	144	165	180	188%	194	215	96
	JUN-SEP	210	235	250	176%	270	295	142
Shell Ck nr Shell								
	JUN-JUL	30	35	39	111%	43	49	35
	JUN-SEP	40	46	51	111%	56	62	46
Bighorn R at Kane								
č	JUN-JUL	1260	1410	1510	265%	1610	1760	570
	JUN-SEP	1380	1560	1680	267%	1800	1980	630

<sup>1) 90%</sup> and 10% exceedance probabilities are actually 95% and 5%

<sup>3)</sup> Median value used in place of average

Reservoir Storage	Current	Last Year	Average	Capacity
End of May, 2017	(KAF)	(KAF)	(KAF)	(KAF)
Boysen	443.3	601.2	498.4	596.0
Bighorn Lake	722.7	847.5	848.0	1356.0
Basin-wide Total	1166.0	1448.7	1346.4	1952.0
# of reservoirs	2	2	2	2

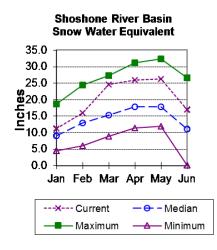
Watershed Snowpack Analysis June 1, 2017	# of Sites	% Median	Last Year % Median
NOWOOD RIVER	4		
GREYBULL RIVER	2	800%	0%
SHELL CREEK	3	136%	69%
BIGHORN RIVER BASIN	10	170%	65%

<sup>2)</sup> Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

#### Shoshone River Basin

#### Snow

Snowpack in this basin is above median for this time of year. Snow Water Equivalent (SWE) is 153% of median (68% last year) in the Shoshone River Basin. See Appendix A at the end of this report for a detailed listing of snow course information.

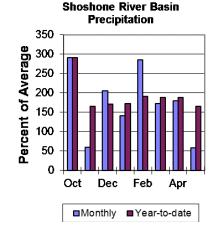


#### Precipitation

Precipitation for last month was 59% of average (82% last year). Monthly percentages range from 104-519% of average. The basin year-to-date precipitation is now 166% of average (100% last year). Year-to-date percentages range from 147-274% of average for the 10 reporting stations.

#### Reservoirs

Current storage in Buffalo Bill Reservoir is about 86% of average this year (132% last year) - the reservoir is at 51% of capacity. Currently, about 331,900 ac-ft are stored in the reservoir compared to 509,100 ac-ft last year.



Detailed reservoir data shown on the following page and in Appendix D.

#### Streamflow

The 50% exceedance forecasts for the June through Sept. period are extremely high for the Shoshone River Basin. The North Fork Shoshone River at Wapiti will yield around 605,000 ac-ft (168% of average). The South Fork of the

Shoshone River near Valley will yield around 355,000 ac-ft (188% of average), and the South Fork above Buffalo Bill Reservoir runoff will yield a record of 345,000 ac-ft (225% of average). The Buffalo Bill Reservoir inflow will yield around 990,000 ac-ft (185% of

average). See the following for detailed runoff volumes.

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#### Shoshone River Basin

Streamflow Forecasts - June 1, 2017

Forecast Exceedance Probabilities for Risk Assessment

Chance that actual volume will exceed forecast

185%

990

1040

1110

535

Forecast 50% 30% 30yr Avg 90% 70% 10% SHO SHONE RIVER BASIN % Avg Period (KAF) (KAF) (KAF) (KAF) (KAF) (KAF) NF Shoshone R at Wapiti JUN-JUL 460 500 525 172% 550 590 305 JUN-SEP 530 575 605 168% 635 680 360 SF Shoshone R nr Valley JUN-JUL 270 285 300 191% 315 330 157 JUN-SEP 315 340 355 188% 370 395 189 SF Shoshone R ab Buffalo Bill Reservoir JUN-JUL 275 300 320 221% 335 360 145 JUN-SEP 295 325 345 225% 365 395 153 Buffalo Bill Reservoir Inflow<sup>2</sup> JUN-JUL 770 835 880 189% 925 990 465

940

- 1) 90% and 10% exceedance probabilities are actually 95% and 5%
- 2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

865

3) Median value used in place of average

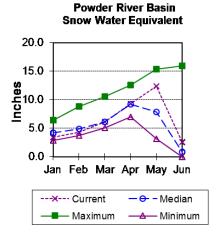
Reservoir Storage End of May, 2017	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Buffalo Bill	331.9	509.1	385.4	646.6
Basin-wide Total	331.9	509.1	385.4	646.6
# of reservoirs	1	1	1	1
Watershed Snowpack Analysis June 1, 2017	# of Sites	% Median	Last Year % Median	
SHOSHONE RIVER BASIN	5	153%	68%	

JUN-SEP

#### Powder River Basin

#### Snow

Powder River SWE is 300% of median (135% last year). Upper Powder River drainage is 0% of median (0% last year). SWE in the Clear Creek drainage is 300% of median (135% last year).



Crazy Woman Creek drainage SWE is 0% of median (0% last year). See Appendix A at the end of this report for a detailed listing of snow course information.

#### Precipitation

Last month's precipitation was 70% of average (84% last year) for the 8 reporting stations. Monthly percentages range from 39-99% of average. Year-to-date precipitation is 119% of average in the basin (92% last year). Precipitation for the year ranges from 92-151% of average.

#### Reservoirs

No reservoir data for the basin.

The 50% exceedance forecasts for

#### Streamflow

the June through September period are above average for most of the basin. The Middle Fork of the Powder River near Barnum should yield around 6,800 ac-ft (112% of average). The North Fork of the Powder River near Hazelton should yield around 6,500 ac-ft (125% of average). Rock Creek near Buffalo will yield about 22,000 ac-ft (147% of average), and Piney Creek at Kearny should yield about 52,000 ac-ft (186% of average). The

Powder River at Moorhead will yield around 240,000 ac-ft (218% of average). The Powder River near Locate will yield around 230,000 ac-ft (189% of average). See the following for detailed runoff volumes.

Powder River Basin Precipitation

300
250
250
150
0 Oct Dec Feb Apr

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#### Powder River Basin

#### Streamflow Forecasts - June 1, 2017

Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast

POWDER RIVER BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
MF Powder R nr Barnum								
	JUN-JUL	2.3	4.4	5.8	121%	7.2	9.3	4.8
	JUN-SEP	3.2	5.3	6.8	119%	8.3	10.4	5.7
NF Powder R nr Hazelton								
	JUN-JUL	3.7	5	5.8	129%	6.6	7.9	4.5
	JUN-SEP	4.2	5.6	6.5	125%	7.4	8.8	5.2
Rock Ck nr Buffalo								
	JUN-JUL	12.8	15.8	17.7	157%	19.7	23	11.3
	JUN-SEP	16.4	19.7	22	147%	24	28	15
Piney Ck at Kearny								
•	JUN-JUL	37	44	49	196%	54	61	25
	JUN-SEP	39	47	52	186%	57	65	28
Powder R at Moorehead								
	JUN-JUL	158	192	215	234%	240	270	92
	JUN-SEP	176	215	240	218%	270	310	110
Powder R nr Locate								
	JUN-JUL	130	175	205	203%	235	280	101
	JUN-SEP	142	195	230	189%	265	320	122

<sup>1) 90%</sup> and 10% exceedance probabilities are actually 95% and 5%

<sup>3)</sup> Median value used in place of average

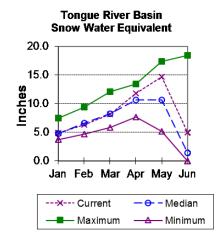
Watershed Snowpack Analysis June 1, 2017	# of Sites	% Median	Last Year % Median
UPPER POWDER RIVER	4		
CLEAR CREEK	2	300%	135%
CRAZY WOMAN CREEK	1		
POWDER RIVER BASIN	6	300%	135%

<sup>2)</sup> Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

#### **Tongue River Basin**

#### Snow

Upper Tongue River SWE is 352% of median (57% last year). The Goose Creek drainage SWE is 0% of median (0% last year). See Appendix A at the end of this report for a detailed listing of snow course information.



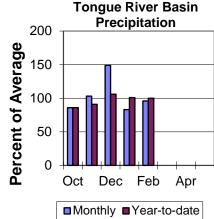
#### Precipitation

Last month's precipitation was 87% of average (71% last year) for 10 reporting stations. Monthly percentages range from 60-125% of average. Year-to-date precipitation is 125% of average in the basin (90% last year). Precipitation for the year ranges from 101-188% of average.

#### Reservoirs

The Tongue River Reservoir currently is storing 67,200 ac-ft, while last year's storage was 80,300 ac-ft. The Tongue River Reservoir is at 194% of

average for this time of year or 85% of capacity. Detailed reservoir data shown below and in Appendix  $\mathcal{D}$ .



#### Streamflow

The 50% exceedance forecasts for the June through September period are about average for the basin. The yield for

Tongue River near Dayton will be around 72,000 ac-ft (116% of average). Big Goose Creek near Sheridan will yield around 50,000 ac-ft (128% of average). Little Goose Creek near Bighorn will yield around 36,000 ac-ft (133% of average). The Tongue River Reservoir Inflow will be around 176,000 ac-ft (131% of average). See below for detailed runoff volumes.

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Tongue River Basin
Streamflow Forecasts - June 1, 2017

Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast

TONGUE RIVER BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Tongue R nr Dayton								
	JUN-JUL	43	53	59	120%	65	75	49
	JUN-SEP	54	65	72	116%	80	91	62
Big Goose Ck nr Sheridan								
•	JUN-JUL	31	37	42	135%	46	52	31
	JUN-SEP	38	45	50	128%	54	61	39
Little Goose Ck nr Bighorn								
· ·	JUN-JUL	22	25	27	141%	29	32	19.1
	JUN-SEP	30	33	36	133%	38	42	27
Tongue River Reservoir Inflow								
•	JUN-JUL	104	132	152	138%	171	199	110
	JUN-SEP	119	153	176	131%	199	235	134

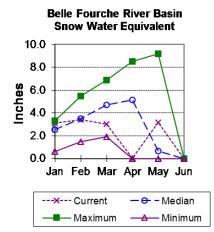
- 1) 90% and 10% exceedance probabilities are actually 95% and 5%
- 2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
- 3) Median value used in place of average

Reservoir Storage End of May, 2017	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Tongue River Res	81.2	80.7	52.6	79.1
Basin-wide Total	81.2	80.7	52.6	79.1
#of reservoirs	1	1	1	1
Watershed Snowpack Analysis June 1, 2017	# of Sites	% Median	Last Year % Median	
GOOSE CREEK	2			
TONGUE RIVER BASIN	6	352%	57%	

#### Belle Fourche River Basin

#### Snow

Belle Fourche River Basin SWE is 0% of median (0% last year). See Appendix A at the end of this report for a detailed listing of snow course information.



#### Precipitation

Precipitation for last month was 55% of average (31% last year) in the Black Hills for the 5 reporting stations. Year-to-date precipitation is 80% of average (82% last year).

#### Reservoirs

Belle Fourche Reservoir is storing 92% of average (142,600 ac-ft), or about 80% of capacity. Keyhole Reservoir is storing 146% of average (147,300 ac-ft), or about 76% of capacity. Shadehill Reservoir is storing

80% of average 48,800 ac-ft), or about 60% of capacity.

Detailed reservoir data shown below and in Appendix D.

# Belle Fourche River Basin Precipitation 200 150 Oct Dec Feb Apr

#### Streamflow

There are no streamflow forecast points for the basin.

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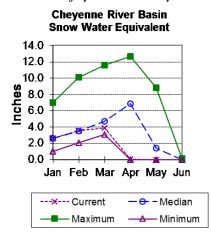
#### Belle Fourche River Basin - June 1, 2017

Reservoir Storage End of May, 2017	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Belle Fourche	142.6	156.7	155.1	178.4
Keyhole	147.3	166.2	100.9	193.8
Shadehill	48.8	49.9	61.4	81.4
Basin-wide Total	338.7	372.8	317.4	453.6
# of reservoirs	3	3	3	3
Watershed Snowpack Analysis June 1, 2017	# of Sites	% Median	Last Year % Median	
BELLE FOURCHE RIVER BASIN	1			

#### Cheyenne River Basin

#### Snow

Cheyenne River Basin SWE is at 0% of median (0% last year). See Appendix A at the end of this report for a detailed listing of snow course information.

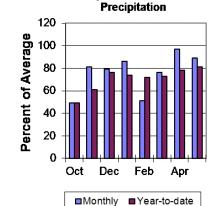


#### Precipitation

Precipitation for last month was 89% of average (36% last year) in the Black Hills. There were three reporting stations. Year-to-date precipitation is 81% of average (68% last year).

#### Reservoirs

Angostura is currently storing 110% of average (111,000 ac-ft), or about 91% of capacity. Deerfield reservoir is storing 105% of average (15,100 ac-ft), or about 99% of capacity. Pactola Reservoir is storing 112% of average (54,800 ac-ft), or about 100% of



Chevenne River Basin

capacity. Detailed reservoir data shown below and in Appendix D.

#### Streamflow

The following runoff values are the 50% exceedance forecasts for the June through July period. These values are very

low. The Deerfield Reservoir Inflow should yield around 1,600 ac-ft (70% of average). Pactola Reservoir Inflow yield will be around 6,200 ac-ft (59% of average). *See the following* 

detailed runoff volumes.

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#### Cheyenne River Basin

#### Streamflow Forecasts - June 1, 2017

Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast

CHEYENNE RIVER BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Deerfield Reservoir Inflow  Pactola Reservoir Inflow	JUN-JUL	0.1	0.91	1.61	70%	2.3	3.3	2.3
	JUN-JUL	1	2.4	6.2	59%	9.9	15.5	10.5

- 1) 90% and 10% exceedance probabilities are actually 95% and 5%
- 2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
- 3) Median value used in place of average

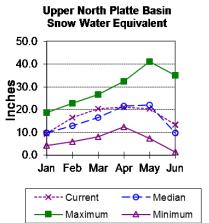
	Reservoir Storage End of May, 2017	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Angostura	l e e e e e e e e e e e e e e e e e e e	111.0	113.9	101.3	122.1
Deerfield		15.1	14.2	14.3	15.2
PactoLa		54.8	55.0	48.9	55.0
	Basin-wide Total	180.9	183.1	164.5	192.3
	#of reservoirs	3	3	3	3

Watershed Snowpack Analysis June 1, 2017	# of Sites	% Median	Last Year % Median
CHEYENNE RIVER BASIN	2		

#### **Upper North Platte River Basin**

#### Snow

The Upper North Platte River Basin above Seminoe Reservoir SWE is 137% of median (164% last year). North Platte above Northgate SWE is 139% of median (154% last year). Encampment



River SWE is 159% of median (224% last year). Brush Creek SWE is 93% of median (127% last year). Medicine Bow and Rock Creek SWE are 143% of median (142% last year). See Appendix A at the end of this report for a detailed listing of snow course information.

#### Precipitation

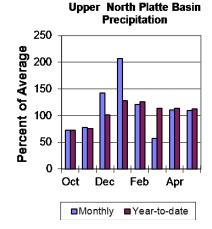
18 reporting stations show last month's precipitation at 110% of average (128% last year). Precipitation varied from 85-143% of average last month. Total water-year-to-date precipitation is 113% of average for the basin (111% last year). Year-to-date percentages range from 70-149% of average.

#### Reservoirs

Seminoe Reservoir is storing 846,500 ac- ft or 83% of capacity. Seminoe Reservoir is at 139% of average and was at 143% of average last year. *Detailed reservoir data shown on the following page and in Appendix D*.

#### Streamflow

The 50% exceedance forecasts for the June through September period are above average for the Upper North Platte River Basin. The yield for the North Platte River near Northgate will be around 197,000 ac-ft (135% of average). The Encampment River near Encampment yield will be around 103,000 ac-ft (123% of average). Rock Creek near Arlington yield will be around 40,000 ac-ft (114% of average). Sweetwater River near Pathfinder will yield a record of about 90,000 ac-



ft (290% of average). Seminoe Reservoir inflow should be around 555,000 ac-ft (125% of average). See the following page for more detailed information on projected runoff.

# Upper North Platte River Basin Streamflow Forecasts - June 1, 2017 Forecast Exceedance Probabilities for Risk Assessment

orecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast

UPPER NORTH PLATTE RIVER BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
North Platte R nr Northgate								
_	JUN-JUL	123	149	167	136%	185	210	123
	JUN-SEP	146	177	197	135%	215	250	146
Encampment R nr Encampment <sup>2</sup>								
	JUN-JUL	68	83	93	124%	103	118	75
	JUN-SEP	77	93	103	123%	113	129	84
Rock Ck nr Arlington								
•	JUN-JUL	28	33	37	116%	41	46	32
	JUN-SEP	30	36	40	114%	44	50	35
Sweetwater R nr Alcova								
	JUN-JUL	71	77	81	312%	85	91	26
	JUN-SEP	78	85	90	290%	95	102	31
Seminoe Reservoir Inflow								
	JUN-JUL	360	435	490	126%	545	620	390
	JUN-SEP	415	500	555	125%	610	695	445

<sup>1) 90%</sup> and 10% exceedance probabilities are actually 95% and 5%

<sup>3)</sup> Median value used in place of average

	Reservoir Storage	Current	Last Year	Average	Capacity
	End of May, 2017	(KAF)	(KAF)	(KAF)	(KAF)
Seminoe		846.5	867.6	607.1	1016.7
	Basin-wide Total	846.5	867.6	607.1	1016.7
	# of reservoirs	1	1	1	1

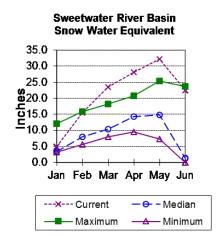
Watershed Snowpack Analysis June 1, 2017	# of Sites	% Median	Last Year % Median
N PLATTE above Northgate	9	139%	154%
ENCAMPMENT RIVER	3	159%	224%
BRUSH CREEK	2	93%	127%
MEDICINE BOW & ROCK CREEKS	1	143%	142%
UPPER NORTH PLATTE RIVER BASIN	17	137%	164%

<sup>2)</sup> Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

#### Sweetwater River Basin

#### Snow

Sweetwater River Basin SWE is 1609% of median (573% last year). See *Appendix A* at the end of this report for a detailed listing of snow course information.



#### Precipitation

Last month's precipitation was 123% of average (147% last year) for the 4 reporting stations ranging from 74-139%. The water year-to-date precipitation for the basin is currently 160% of average (106% last year). Year-to-date percentages range from 121-178% of average.

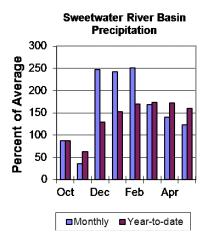
#### Reservoirs

Reservoir storage is as follows: Pathfinder 916,100 ac-ft (90% of capacity, 145% of average, 172% last year).

#### Streamflow

The 50% exceedance forecast

for the June through September period will be a record high. The Sweetwater River near Pathfinder will yield about 90,000 ac-ft (290% of average). See below for detailed information on projected runoff.



Data Current as of: 6/6/2017 9:54:28 AM

#### Sweetwater River Basin Streamflow Forecasts - June 1, 2017

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

SWEETWATER RIVER BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Sweetwater R nr Alcova								
	JUN-JUL	71	77	81	312%	85	91	26
	JUN-SEP	78	85	90	290%	95	102	31

- 1) 90% and 10% exceedance probabilities are actually 95% and 5%
- 2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
- 3) Median value used in place of average

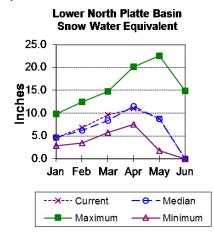
	Reservoir Storage	Current	Last Year	Average	Capacity
	End of May, 2017	(KAF)	(KAF)	(KAF)	(KAF)
Pathfinder		916.1	1089.5	633.8	1016.5
	Basin-wide Total	916.1	1089.5	633.8	1016.5
	#of reservoirs	1	1	1	1

Watershed Snowpack Analysis June 1, 2017	# of Sites	% Median	Last Year % Median
SWEETWATER RIVER BASIN	3	1609%	573%

#### Lower North Platte River Basin

#### Snow

Lower North Platte River Basin SWE is 0% of median (0% last year). Deer and LaPrele Creeks SWE is 0% of median (0% last year). See Appendix A at the end of this report for a detailed listing of snow course information.

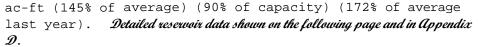


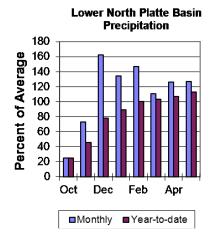
#### Precipitation

Last month's precipitation was 127 of average (98% last year). The 8 reporting station percentages for the month range from 69-165%. The water year-to-date precipitation for the basin is currently 113% of average (122% last year). Year-to-date percentages range from 102-150% of average.

#### Reservoirs

Reservoir storage is as follows: Alcova 180,400 ac-ft (100% of average) (98% of capacity); Glendo 480,100 ac-ft (101% of average) (95% of capacity); Guernsey 30,000 ac-ft (87% of average) (66% of capacity); Pathfinder 916,100





#### Streamflow

The 50% exceedance forecasts for the June through September period will be above average. North Platte - Alcova to Orin

Gain will yield - ac-ft. LaPrele Creek above LaPrele Reservoir should yield around 5,700 ac-ft (119% of average). North Platte River below Glendo Reservoir should yield around 550,000 ac-ft (136% of average), and below Guernsey Reservoir should yield around 545,000 ac-ft (136% of average). See the following for more detailed information on projected runoff.

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#### Lower North Platte River Basin Streamflow Forecasts - June 1, 2017

Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast

LOWER NORTH PLATTE RIVER BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
La Prele Ck ab La Prele Reservoir								
	JUN-JUL	1.4	3.7	5.3	118%	6.8	9.1	4.5
	JUN-SEP	1.68	4.1	5.7	119%	7.3	9.7	4.8
North Platte R bl Glendo Reservoir								
	JUN-JUL	375	455	510	136%	565	645	375
	JUN-SEP	405	490	550	136%	610	695	405
North Platte R bl Guernsey Reservoir								
•	JUN-JUL	370	450	505	136%	560	645	370
	JUN-SEP	395	485	545	136%	605	695	400

- 1) 90% and 10% exceedance probabilities are actually 95% and 5%
- 2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
- 3) Median value used in place of average

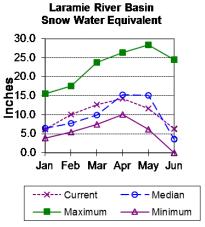
Re	eservoir Storage	Current	Last Year	Average	Capacity
Er	nd of May, 2017	(KAF)	(KAF)	(KAF)	(KAF)
Alcova		180.4	180.0	179.7	184.3
Glendo		480.1	551.2	475.0	506.4
Guernsey		30.0	30.3	34.3	45.6
Pathfinder		916.1	1089.5	633.8	1016.5
	Basin-wide Total	1606.6	1851.0	1322.8	1752.8
	# of reservoirs	4	4	4	4

Watershed Snowpack Analysis June 1, 2017	# of Sites	% Median	Last Year % Median
DEER & LaPRELE CREEKS	2		
LOWER NORTH PLATTE RIVER BASIN	4		

#### Laramie River Basin

#### Snow

SWE for the entire Laramie River Basin (above mouth entering North Platte) is 173% of median (343% last year). SWE for the Laramie River above Laramie is 204% of median (276%



last year). SWE for the Little Laramie River is 125% of median (449% last year). SWE total for the entire North Platte River Basin above Torrington is 169% of median (183% last year). See Appendix A at the end of this report for a detailed listing of snow course information.

#### Precipitation

Last month's precipitation was 123% of average (114% last year). For the 12 reporting station percentages for the month range from 80-168%. The water year-to-date precipitation for the basin is currently 112% of average (128% last year). Year-to-date percentages range from 97-150% of average.

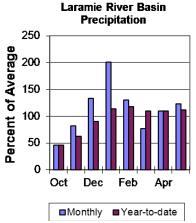
Chance that actual volume will exceed forecast

#### Reservoirs

Reservoir storage is as follows: Wheatland #2 89,000 ac-ft (160% of average) (90% of capacity) was (136% of average last year). Detailed reservoir data shown on the following page and in Appendix  $\mathcal{D}$ .

#### Streamflow

The 50% exceedance forecasts for the June through September period will be slightly above average. Laramie River near Woods Landing should yield around 111,000 ac-ft (135% of average). The Little Laramie near Filmore should produce about 42,000 ac-ft (108% of average). See below for detailed information on projected runoff.



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#### Laramie River Basin

Streamflow Forecasts - June 1, 2017

Forecast Exceedance Probabilities for Risk Assessment

LARAMIE RIVER BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Laramie R nr Woods								
	JUN-JUL	74	88	98	138%	107	121	71
	JUN-SEP	86	101	111	135%	122	137	82
Little Laramie R nr Filmore								
	JUN-JUL	28	34	38	109%	42	48	35
	JUN-SEP	31	38	42	108%	47	53	39

- 1) 90% and 10% exceedance probabilities are actually 95% and 5%
- 2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
- 3) Median value used in place of average

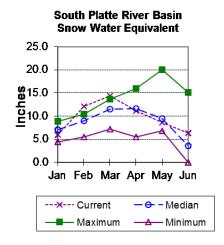
Reservoir Storage	Current	Last Year	Average	Capacity
End of May, 2017	(KAF)	(KAF)	(KAF)	(KAF)
Wheatland #2	89.0	75.6	55.7	98.9
Basin-wide Total	89.0	75.6	55.7	98.9
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis June 1, 2017	# of Sites	% Median	Last Year % Median
LARAMIE RIVER abv Laramie	4	204%	276%
LITTLE LARAMIE RIVER	2	125%	449%
LARAMIE RIVER BASIN	7	173%	343%
NORTH PLATTE TOTAL RIVER BASIN	26	169%	183%

#### South Platte River Basin (WY)

#### Snow

South Platte River Basin SWE in WY is 177% of median (179% last year). See Appendix A at the end of this report for a detailed listing of snow course information.



#### Precipitation

Last month's precipitation was 148% of average (98% last year) for the 5 reporting stations. The water year-to-date

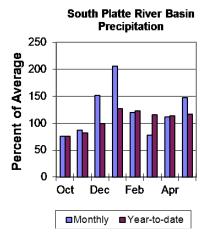
precipitation for the basin is currently 117 of average (116% last year). Year-to-date percentages range from 103-156% of average.

#### Reservoirs

No reservoir data for the basin.

#### Streamflow

There are no streamflow forecast points for the basin.



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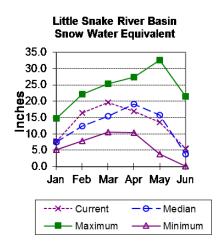
#### South Platte River Basin - June 1, 2017

Watershed Snowpack Analysis	# of Sites	% Median	Last Year	
June 1, 2017			% Median	
SOUTH PLATTE RIVER BASIN	4	177%	179%	

#### Little Snake River Basin

#### Snow

Little Snake River drainage SWE is 145% of median (214% last year). See *Appendix A* at the end of this report for a detailed listing of snow course information.



#### Precipitation

Precipitation across the basin was 85% of average (168% last year) for the eight reporting stations. Last month's precipitation ranged from 70-102% of average. The Little Snake River Basin water-year-to-date precipitation is currently 108% of average (110% last year). Year-to-date percentages range from 88-127% of average.

#### Reservoirs

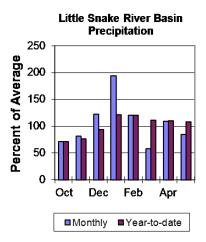
High Savery Dam - 22,700 ac-ft (105% of average) (101% of capacity) (104% of average last year). See below for detailed information on reservoirs and in Appendix D.

#### Streamflow

The 50% exceedance forecasts for the June through July period will be below average. The Little Snake River near Slater should yield around 60,000 ac-ft (91% of average). The Little Snake River near Dixon should yield around 110,000 ac-ft (81% of average). See below for detailed information on

projected runoff.

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#### Little Snake River Basin Streamflow Forecasts - June 1, 2017

Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast

LITTLE SNAKE RIVER BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Little Snake R nr Slater <sup>2</sup>								
	APR-JUL	125	136	145	93%	154	170	156
	JUN-JUL	40	51	60	91%	69	85	66
Little Snake R nr Dixon <sup>2</sup>								
	APR-JUL	225	250	275	80%	300	340	345
	JUN-JUL	60	88	110	81%	134	174	135

- 1) 90% and 10% exceedance probabilities are actually 95% and 5%
- 2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
- 3) Median value used in place of average

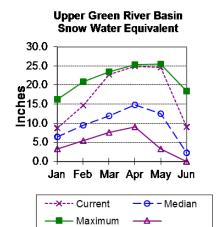
Reservoir Storage	Current	Last Year	Average	Capacity
End of May, 2017	(KAF)	(KAF)	(KAF)	(KAF)
High Savery Reservoir	22.7	22.5	21.6	22.4
Basin-wide Total	22.7	22.5	21.6	22.4
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis June 1, 2017	# of Sites	% Median	Last Year % Median
LITTLE SNAKE RIVER BASIN	8	145%	214%

#### Upper Green River Basin

#### Snow

Upper Green River Basin above Fontenelle Reservoir SWE is 394% of median (159% last year). Green River Basin above Warren Bridge SWE is 721% of median (254% last year). West Side



of Upper Green River Basin SWE is 320% of median (148% last year). New Fork River SWE is 0% of median (0% last year). Big Sandy-Eden Valley Basin SWE is 0% of median (0% last year). See Appendix A at the end of this report for a detailed listing of snow course information.

#### Precipitation

The 15 reporting precipitation sites in the basin were 63% of average last month (154% last year). Last month's precipitation varied from 35-128% of average. Water year-to-date precipitation is 162% of average (105% last year). Year to date percentages of average range from 147-201%.

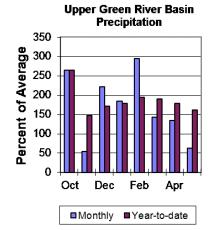
#### Reservoir

Storage in Big Sandy Reservoir is 37,700 ac-ft or 98% of

capacity (130% of average) (113% last year). Fontenelle Reservoir is 128,900 ac-ft (37% of capacity) (79% of average) (154% last year). Detailed reservoir data shown on the following page and in Appendix  $\mathcal{D}$ .

#### Streamflow

The 50% exceedance forecasts for the June through July period will be way above average. The yield on the Green River at Warren Bridge is about 305,000 ac-ft (182% of average). Pine Creek above Fremont Lake yield will be about 125,000 ac-ft (164% of average). New Fork River near Big Piney yield will be a record high of about 525,000 ac-ft



(206% of average). Fontenelle Reservoir Inflow is estimated to be a record around 1,020,000 ac-ft (216% of average), and Big Sandy near Farson yield will be around 65,000 ac-ft (191% of average). See the following for a more detailed forecast.

### Upper Green River Basin Streamflow Forecasts - June 1, 2017 Forecast Exceedance Probabilities for Risk Assessment

Chance that actual volume will exceed forecast

UPPER GREEN RIVER BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Green R at Warren Bridge								
	APR-JUL	415	435	450	184%	460	480	245
	JUN-JUL	270	290	305	182%	315	335	168
Pine Creek ab Fremont Lake								
	APR-JUL	137	144	149	152%	154	161	98
	JUN-JUL	113	120	125	164%	130	137	76
New Fork R nr Big Piney								
	APR-JUL	665	695	715	201%	735	765	355
	JUN-JUL	475	505	525	206%	545	575	255
Fontenelle Reservoir Inflow								
	APR-JUL	1560	1630	1670	230%	1710	1780	725
	JUN-JUL	910	975	1020	215%	1060	1130	475
Big Sandy R nr Farson								
	APR-JUL	82	87	91	175%	95	100	52
	JUN-JUL	56	61	65	191%	69	74	34

<sup>1) 90%</sup> and 10% exceedance probabilities are actually 95% and 5%

<sup>3)</sup> Median value used in place of average

	Reservoir Storage	Current	Last Year	Average	Capacity
	End of May, 2017	(KAF)	(KAF)	(KAF)	(KAF)
Big Sandy		37.7	33.0	29.1	38.3
Fontenelle		128.9	251.9	164.0	344.8
	Basin-wide Total	166.6	284.9	193.1	383.1
	# of reservoirs	2	2	2	2

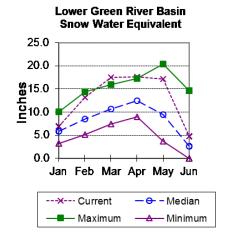
Watershed Snowpack Analysis June 1, 2017	# of Sites	% Median	Last Year % Median
GREEN above Warren Bridge	4	721%	254%
UPPER GREEN - West Side	4	320%	148%
NEW FORK RIVER	2		
BIG SANDY-EDEN VALLEY	2		
GREEN above Fontenelle	11	394%	159%

<sup>2)</sup> Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

#### Lower Green River Basin

#### Snow

Lower Green River Basin SWE is 183% of median (145% last year). Hams Fork drainage SWE is 248% of median (114% last year). Blacks Fork drainage SWE is 112% of median (179% last



year). Henrys Fork SWE is 0% of median (0% last year). SWE for the entire Green River Basin (above Flaming Gorge) is 303% of median (153% last year). See Appendix A at the end of this report for a detailed listing of snow course information.

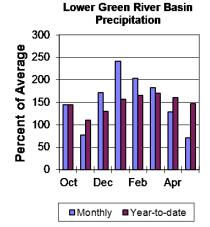
#### Precipitation

Precipitation for the 12 reporting stations during last month was 71% of average (223% last year). Precipitation ranged from 52-161% of average for the month. The basin year-to-date precipitation is currently 147% of average (125% last year). Year-to-date percentages range from 101-250% of average.

#### Reservoirs

Fontenelle Reservoir is currently storing 128,900 ac-

ft; this is 79% of average (154% last year) (37% of capacity). Flaming Gorge is currently storing 3,202,900 acft; this is 104% of average (112% last year) (85% of capacity). Viva Naughton is currently storing 35,200 acft; this is 85% of average (105% last year) (83% of capacity). Detailed reservoir data shown on the following page and in Appendix D.



#### Streamflow

The 50% exceedance forecasts for the June through July period will be above average. The Green River near Green River will yield about 1,060,000 ac-ft (221% of average).

The Blacks Fork near Robertson will yield about 65,000 ac-ft (118% of average). East Fork of Smiths Fork near Robertson will yield around 20,000 ac-ft (113% of average). Hams Fork below Pole Creek near Frontier will yield 55,000 ac-ft (212% of average). The Hams Fork Inflow to Viva Naughton Reservoir will yield about 60,000 ac-ft (194% of average). The Flaming Gorge Reservoir inflow will be about 1,270,000 ac-ft (212% of average). See the following page for more detailed information on projected runoff.

# Lower Green River Basin Streamflow Forecasts - June 1, 2017 Forecast Exceedance Probabilities for Risk Assessment

precast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast

LOWER GREEN RIVER BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Green R nr Green River, WY 2								
	APR-JUL	1610	1680	1720	236%	1760	1820	730
	JUN-JUL	955	1020	1060	221%	1100	1160	480
Blacks Fk nr Robertson								
	APR-JUL	99	109	116	135%	124	136	86
	JUN-JUL	48	58	65	118%	73	85	55
EF of Smiths Fork nr Robertson <sup>2</sup>								
	APR-JUL	29	33	36	133%	39	44	27
	JUN-JUL	13	17	20	113%	23	28	17.7
Hams Fk bl Pole Ck nr Frontier								
	APR-JUL	114	121	126	233%	131	140	54
	JUN-JUL	43	50	55	212%	60	69	26
Viva Naughton Reservoir Inflow								
-	APR-JUL	154	165	173	234%	182	196	74
	JUN-JUL	41	52	60	194%	69	83	31
Flaming Gorge Reservoir Inflow <sup>2</sup>								
	APR-JUL	2030	2130	2200	224%	2270	2370	980
	JUN-JUL	1100	1200	1270	212%	1340	1440	600

<sup>1) 90%</sup> and 10% exceedance probabilities are actually 95% and 5%

<sup>3)</sup> Median value used in place of average

Reservoir Storage	Current	Last Year	Average	Capacity
End of May, 2017	(KAF)	(KAF)	(KAF)	(KAF)
Fontenelle	128.9	251.9	164.0	344.8
Flaming Gorge Reservoir	3202.9	3427.2	3070.0	3749.0
Viva Naughton Res	35.2	43.5	41.5	42.4
Basin-wide Total	3367.0	3722.7	3275.5	4136.2
# of reservoirs	3	3	3	3

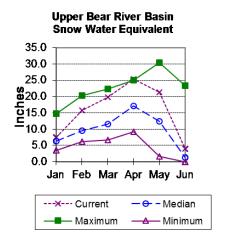
Watershed Snowpack Analysis June 1, 2017	# of Sites	% Median	Last Year % Median
HAMS FORK RIVER	3	248%	114%
BLACKS FORK	2	112%	179%
HENRYS FORK	2		
LOWER GREEN RIVER BASIN	7	183%	145%
GREEN above FLAMING GORGE	18	303%	153%

<sup>2)</sup> Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

#### **Upper Bear River Basin**

#### Snow

Upper Bear River Basin above the UT-WY state line SWE is 178% of median (40% last year).



SWE in the Wyoming portion of the Bear River drainage (Smiths and Thomas Forks) is 0% of median (0% last year). Upper Bear River Basin SWE above WY-UT state line is 306% of median 105% last year). See Appendix A at the end of this report for a detailed listing of snow course information.

#### Precipitation

Precipitation for last month was 47% of average for the 9 reporting stations; this was 173% last year. The year-to-date precipitation for the basin is 144% of average; this was 105%

last year. Year-to-date percentages range from 108-233% of average.

#### Reservoirs

Storage in Woodruff Narrows Reservoir is 56,000 ac-ft about

98% of capacity (125% of average) (130% last year). **Detailed** reservoir data shown below and in Appendix D.

#### Streamflow

The following 50% exceedance forecasts for the June through Sept. period will be extremely high. The Bear River near the Utah-Wyoming State Line should yield about 119,000 ac-ft (153% of average). The Bear River above Reservoir near Woodruff should yield around 119,000 ac-ft (186% of average).

300 250 250 200 150 0 Oct Dec Feb Apr

Upper Bear River Basin

**Precipitation** 

The Smiths Fork River near Border Jct. will yield around 139,000 ac-ft (214% of average).

Chance that actual volume will exceed forecast

#### See below for detailed information on projected runoff.

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## Upper Bear River Basin Streamflow Forecasts - June 1, 2017 Forecast Exceedance Probabilities for Risk Assessment

Forecast 50% 30% 10% 30yr Avg UPPER BEAR RIVER BASIN % Avg Period (KAF) (KAF) (KAF) (KAF) (KAF) (KAF) Bear R nr UT-WY State Line APR-JUL 112 149 166 178 159% 190 205 APR-SEE 160 180 193 157% 205 225 123 127 JUN-JUL 81 95 104 158% 113 66 JUN-SEP 91 108 119 153% 130 146 78 Bear R ab Resv nr Woodruff APR-JUL 156 192 215 178% 240 280 121 APR-SEP 177 220 245 191% 275 315 128 JUN-JUL 70 93 109 191% 124 147 57 JUN-SEP 72 100 186% 165 Smiths Fk nr Border APR-JUL 181 191 197 221% 205 215 89 APR-SEP 205 215 225 216% 230 240 104 JUN-JUL 103 109 113 226% 123 JUN-SEF 214%

<sup>3)</sup> Median value used in place of average

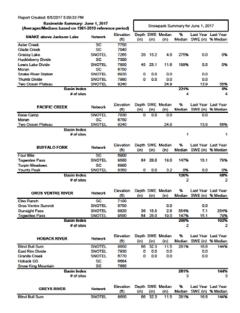
	Reservoir Storage End of May, 2017	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
W	oodruff Narrows Reservoir	56.0	58.2	44.8	57.3
	Basin-wide Total	56.0	58.2	44.8	57.3
	# of reservoirs	1	1	1	1
	Watershed Snowpack Analysis June 1, 2017	# of Sites	% Median	Last Year % Median	

Watershed Snowpack Analysis June 1, 2017	# of Sites	% Median	Last Year % Median
UPPER BEAR RIVER in Utah	3	178%	40%
SMITHS & THOMAS FORKS	2		
UPPER BEAR RIVER BASIN	7	306%	105%

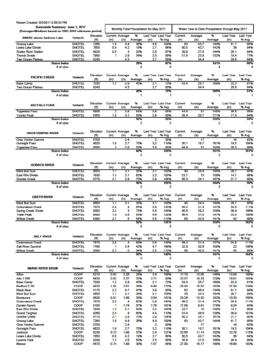
<sup>1) 90%</sup> and 10% exceedance probabilities are actually 95% and 5%

<sup>2)</sup> Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

## Appendix A (Snowpack) In Word double click the object below to view entire document



 ${\bf Appendix} \ B \ ({\bf Precipitation})$  In Word double click the object below to view entire document

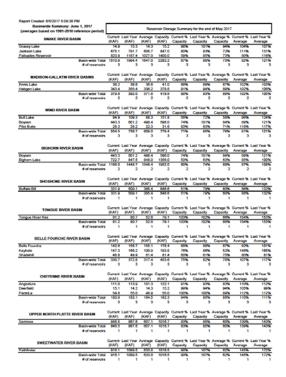


#### Appendix C (Forecasts)

#### In Word double click the object below to view entire document

Report Created:			Streamflo	ow Forecast	Summary: Ju	ne 1, 2017		
6/6/2017 9:52:40 AM	(averages based on 1981-2010 reference period)							
		Forecast Exceedance Probabilities for Risk Assessment						
			Chance ti	hat actual vol	ume will excee	ed forecast		
SNAKE RIVER BASIN	Forecast	90%	70%	50%	% Avg	30%	10%	30yr Avg
	Period	(KAF)	(KAF)	(KAF)	20 CAS	(KAF)	(KAF)	(KAF)
Snake R nr Moran*								
	JUN-JUL	575	630	005	150%	700	755	425
	JUN-SEP	670	730	775	153%	820	880	505
Snake R ab Reservoir nr	Alpine <sup>2</sup>							
	JUN-JUL	2150	2260	2340	183%	2410	2520	1280
	JUN-SEP	2610	2750	2840	170%	2930	3000	1610
Snake R nr Invin 2								
	JUN-JUL	2840	2990	3090	182%	3190	3340	1700
	JUN-SEP	3550	3730	3850	170%	3970	4100	2190
Snake R nr Heise <sup>2</sup>								
onake it in neise	JUN-JUL	3000	3150	3260	181%	3360	3510	1800
	JUN-SEP	3790	3970	4100	174%	4230	4410	2350
Pacific Ck at Moran	Juneau	3700	3410	4100		42.00	4410	2,000
- accord to the an interest	JUN-JUL	133	149	159	185%	170	186	86
	JUN-SEP	144	160	172	179%	183	199	96
Buffalo Fk ab Lava Ck nr		04	.00	.72	110%	183	.00	96
Dumaro Fit ad Lava Cit ne	JUN-JUL	200	315	330	161%	245	365	206
	JUN-SEP	340	365	385	100%	405	430	240
Greys R ab Reservoir nr		340	300	300	100%	400	400	240
Greys it as reservoir in a	JUN-JUL	295	310	320	195%	330	345	164
	JUN-SEP	370		405				
Salt R ab Reservoir or Et		370	360	400	100%	415	435	215
Dan N au Neservur nr Es		255	275	290	203%	310		143
	JUN-JUL JUN-SEP	355	380	400	190%	420	330 450	210
3) Median value used in p			Casa and Con-	and a sea floor	abilities for Rin	ch **********		,
					ame will excee		•	l
								•
MADISON-GALLATIN	Forecast	90%	70%	50%		30%	10%	30yr Avg
RIVER BASINS	Period	(KAF)	(KAF)	(KAF)	% Avg	(KAF)	(KAF)	(KAF)
Hebgen Reservoir Inflow								
	JUN-JUL	175	199	215	121%	230	255	178
	JUN-SEP	265	300	325	110%	350	385	280
1) 90% and 10% exceeds								
<ol><li>Forecasts are for unim</li></ol>			ill be depende	ent on manag	ement of upsb	ream reservoi	rs and diversi	ons
<ol><li>Median value used in p</li></ol>	place of avera	ge						
					abilities for Ris		në.	l
	- 1		Chance t	hat actual vol	ame will excee	ed forecast		ı
YELLOWSTONE	Forecast	90%	70%	50%	% Avg	30%	10%	30yr Avg
RIVER BASIN	Period	(KAF)	(KAF)	(KAF)	20 1/1/19	(KAF)	(KAF)	(KAF)
Yellowstone R at Yellows	itone Lake Out	Set						
	JUN-JUL	500	570	620	133%	670	740	405
	JUN-SEP	740	825	885	135%	940	1030	655
Yellowstone R at Corwin								
The second	JUN-JUL	1130	1260	1340	129%	1420	1550	1040
	JUN-SEP	1420	1570	1670	120%	1770	1920	1330
Yellowstone R at Livingst								
	JUNJUL	1280	1440	1540	131%	1640	1790	1180
	JUN-SEP	1600	1790	1920	126%	2040	2230	1520

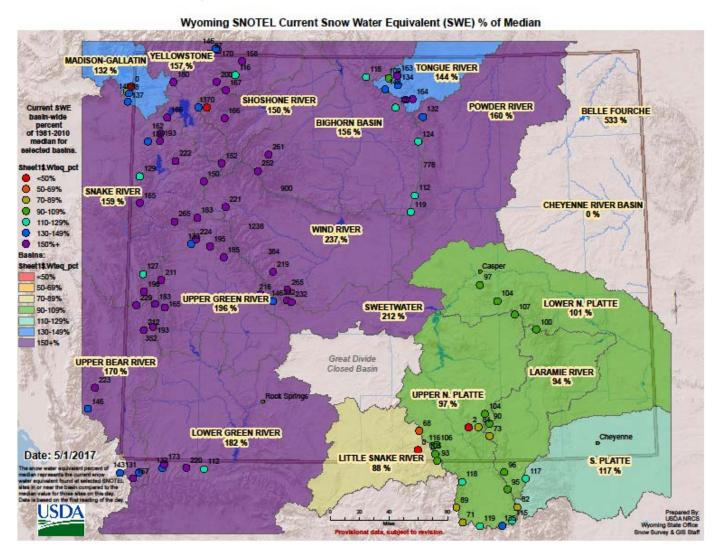
#### ${\bf Appendix} \ {\bf D} \ ({\bf Reservoirs})$ In Word double click the object below to view entire document



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Sonny Perdue (Chief) U.S.D.A. Natural Resources Conservation Service Washington D.C. Astrid Martinez State Con. N R C S Casper, Wyoming

June 1st, 2017 Statewide SWE @ 228% of median



The above map is only for SNOTELS and does not include snow courses. The Outlook Report includes the snow courses.

The Following Agencies and Organizations Cooperate with the Natural 1	Resources
Conservation Service on the Snow Survey Work.	

FEDERAL:
United States Department of the Interior (National Park Service) United States Department of Agriculture
(Forest Service)
United States Department of the Interior (Bureau of Reclamation)
United States Department of Commerce NOAA (National Weather Service)
State:
The Wyoming State Engineer's Office
The University of Wyoming
Local:
The City of Cheyenne
The City of Rawlins



# Wyoming

Basin Outlook Report
Natural Resources Conservation Service
Casper, WY





Natural Resources Conservation Service 100 East B Street Box 33124 Casper, WY 82601

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